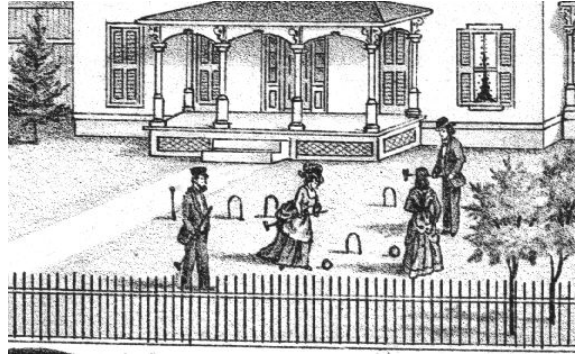# Design Challenge 4: Robot Croquet

1   Goal

In this design challenge you will program your robot to navigate as many of the croquet courses as possible. Each course is worth a different number of points. Top scorers win fabulous prizes!

2   The Rules:

1. You can brainstorm as a class. In fact, we will start with a group brainstorming session.
2. You must write your program(s) individually.
3. You must use your velocity controller from PS06.
4. You can test and measure anything you want, but get your robot doing something as soon as possible - this design challenge ends promptly at 3:45pm.
5. You must start your robot inside the start circle for each course. You earn points if your robot passes through the wicket at the end of the course while staying within 20 cm (2 robots, or the width of a sheet of paper) of the course line.
6. When you want to try to score points, get a member of the course staff to observe your robot's performance. If your robot run out-of-bounds or misses the wicket, you can place it back at the starting position and try again. You can do this as many times as you like. Eventually the staff member will get bored and wander off, and you will need to go fix your software.
7. You can only earn points for each course once.

3   Hints:

1. The math for the arc equations might be useful. I would write a function of the form:
   def arc(velocity, radius, direction, distance)
2. Start testing early. Figuring out the timing for some of these courses will take a while. Do early runs to figure out how well your controller is working.

4   Score Sheet:

1. ____ "Quarter Pipe" (1pt)   2. ____ "Half Pipe" (2pts)
3. ____ "Candy Cane" (3pts)   4. ____ "Curly Q" (3pts)
5. ____ "Left Hook" (4pts)   6. ____ "U-Turn" (5pts)
7. ____ "Long Distance" (5pts)   8. ____ "The Esses" (6pts)